

35t Cold Electronics Status

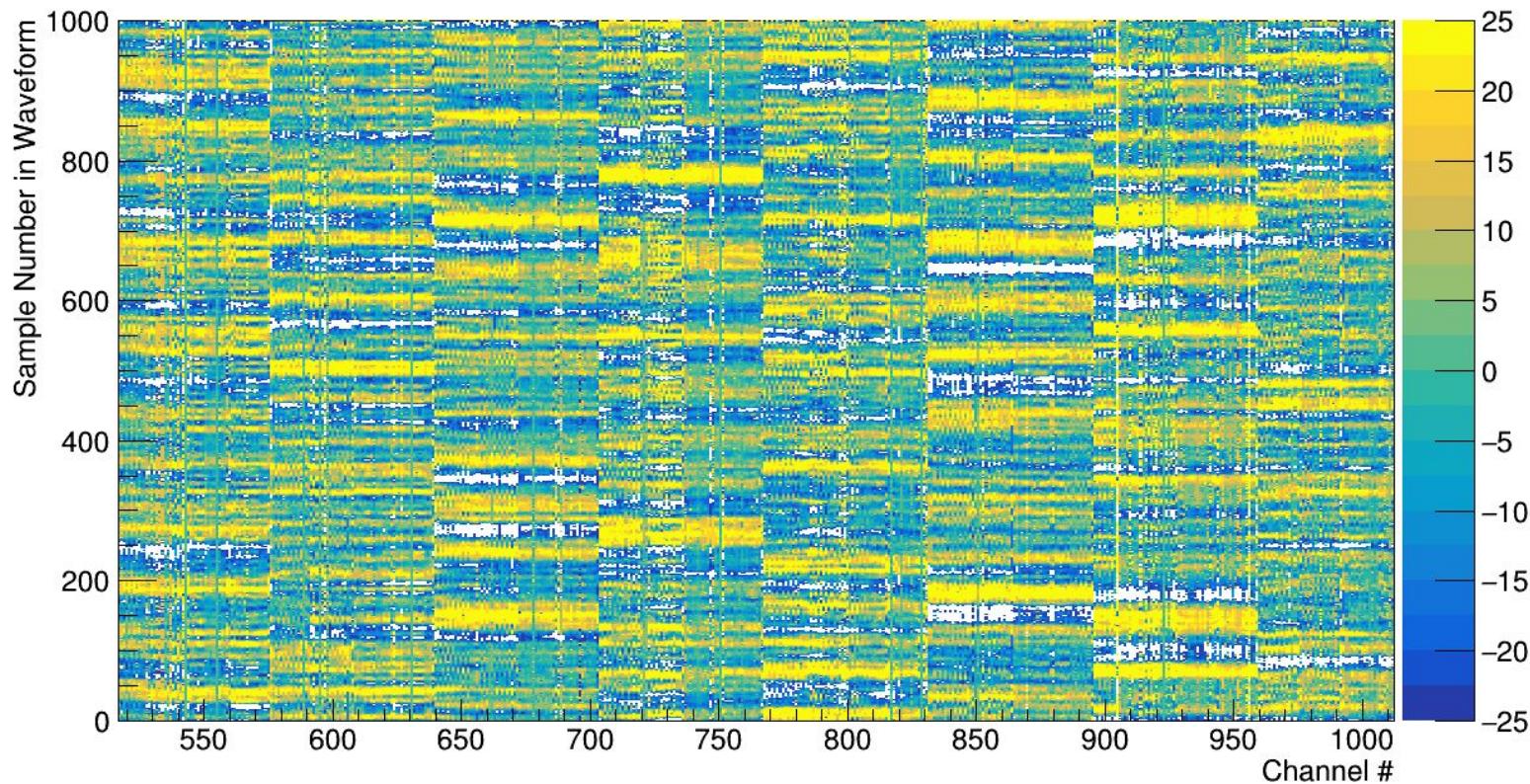
20160210 - 35t - B.Kirby

35t Noise Measurements

- Pre-cooldown runs:
 - Run 8474-8479: Gain = 4.7mV/fC, shaping = 1,2,3us, pulse =0, 1, default baselines
 - Run 8487-8492: Gain = 7.8mV/fC, shaping = 1,2,3us, pulse =0, 1, default baselines
 - Run 8513-8516,8520-8521: Gain = 14mV/fC, shaping = 1,2,3us, pulse =0, 1, default baselines
- Post-cooldown runs:
 - Run 10115-10117 Gain = 0, shaping time 1-3, baseline 200mV, no pulser
 - Run 10118-10120 Gain = 1, shaping time 1-3, baseline 200mV, no pulser
 - Run 10121-10123 Gain = 2, shaping time 1-3, baseline 200mV, no pulser
 - Run 10422-10425, Gain=0, shaping=1,2,3, baseline 200mV, pulser 1
 - Run 10426-10428, Gain=1, shaping=1,2,3, baseline 200mV, pulser 1
 - Run 10429-10431, Gain=2, shaping=1,2,3, baseline 200mV, pulser 1
- Note: switched pedestals to 200mV after cooldown for initial look at noise measurements

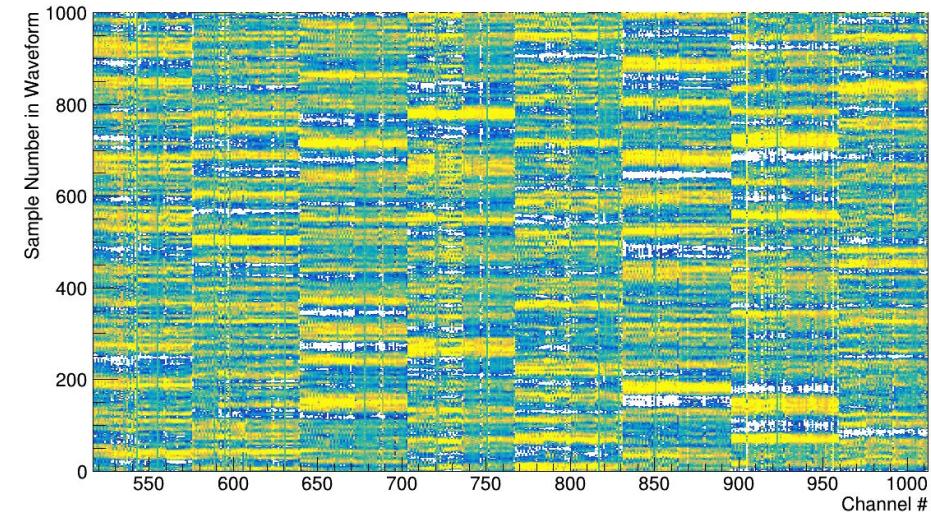
Correlated Noise

Digitized Waveform Vs. Channel #

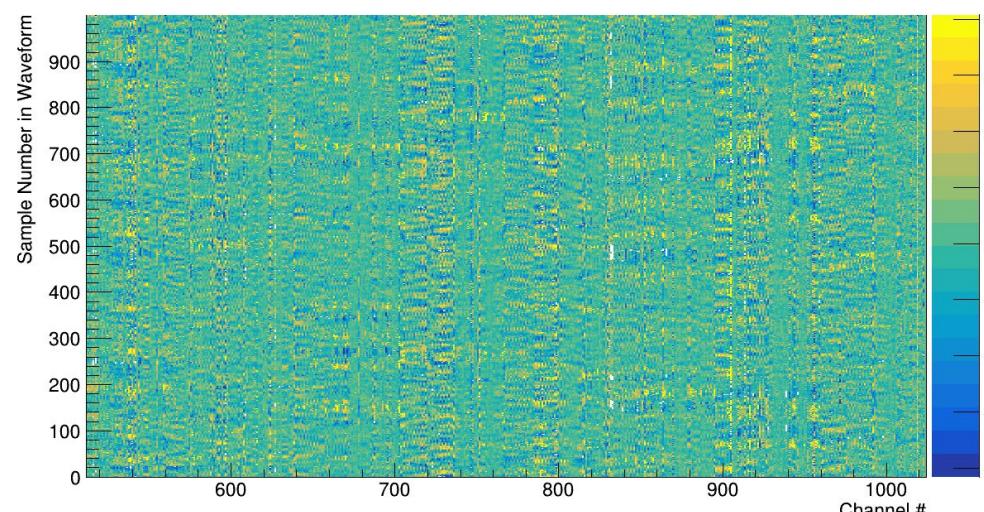


Correlated Noise Subtraction

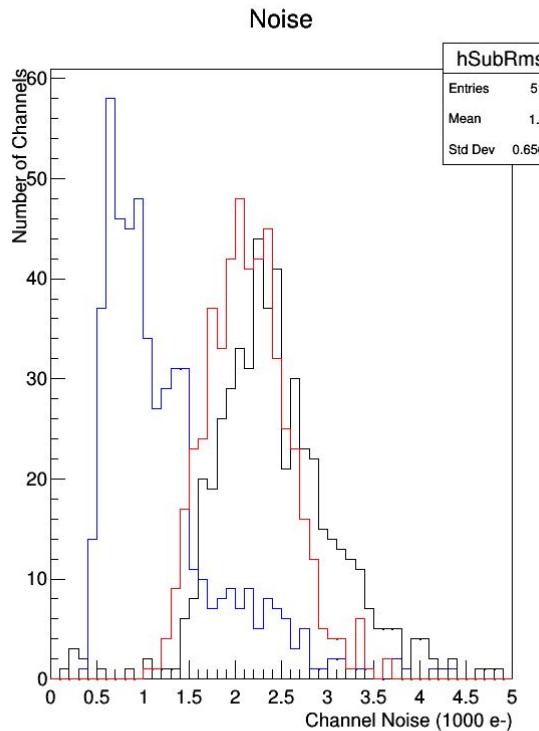
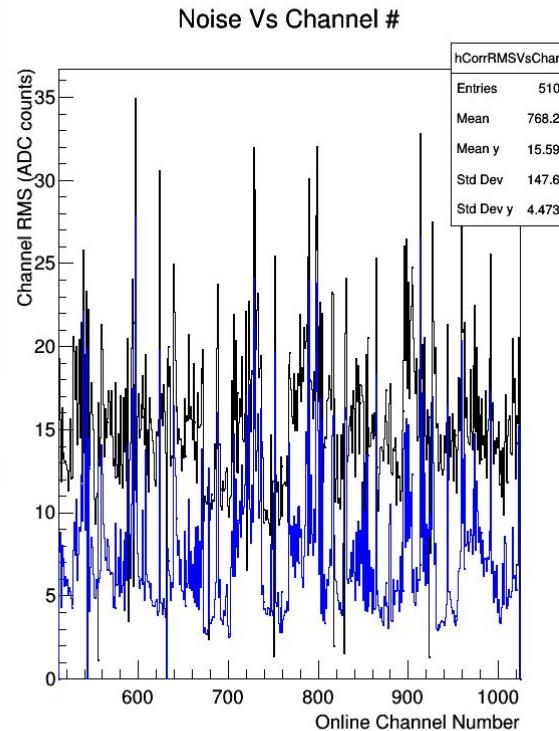
Digitized Waveform Vs. Channel #



Correlated Noise Subtracted Waveform Vs Channel #



Correlated Noise Subtracted Measurements



Black = Raw Noise
Blue = Noise after subtraction
Red = Correlated noise contribution

- Correlated noise subtraction reduces noise levels (mainly on collection plane)

Noise Summary

Gain (mV/fC)	Shaping Time (us)	APA Gain (ADCs / ke-)	Pedestal RMS (ENC 1000 e-)	Correlated Noise Subtracted (ENC 1000e-)	Correlated Noise Magnitude (ENC 1000e-)
4.7	1	2.06	2.45	1.88	1.80
4.7	2	2.10	2.47	1.61	1.96
4.7	3	2.12	2.76	2.07 (?)	2.02
7.8	1	3.41	2.33	1.73	1.72
7.8	2	3.51	2.41	1.79	1.73
7.8	3	3.53	3.4	1.74	3.16
14	1	6.12	2.27	1.65	1.62
14	2	6.30	2.20	1.31	1.80
14	3	6.35	2.43	1.21	2.14

Summary

- Results still a little preliminary
- Tradeoff between lowest possible noise after correlated noise subtraction and lowest raw pedestal RMS
 - Zero-suppression requires lowest possible raw pedestal RMS (1us settings), physics prefers lowest possible noise (3us settings)
 - ADC stuck code mitigation favours longer shaping times (more samples provides greater probability of recovering signal)
- 900mV pedestal setting results in ~50% increase in correlated noise (preliminary)